

LISTING OF CLAIMS

No Admission. The claims presented below are labeled pursuant to the request of the Patent and Trademark Office for convenience in examination. The cancellation of a claim or reference to a claim as “currently amended” is not an admission that the claim was altered for any reason related to patentability.

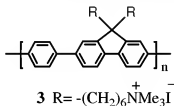
The claim listing below replaces all prior versions and listings of claims in this application:

Listing of Claims

1. (Currently Amended) An energy transfer assay method for analyzing binding of a sensor polynucleotide binding protein to a target polynucleotide comprising:
 - providing a sample that is suspected of containing a target polynucleotide;
 - providing a polycationic multichromophore that interacts with the target polynucleotide and upon excitation is capable of transferring energy to a signaling chromophore;
 - providing a sensor polynucleotide binding protein (PBP) that can bind to the target polynucleotide, said sensor PBP conjugated to the signaling chromophore;
 - contacting the sample with the sensor PBP and the multichromophore in a solution under conditions in which the sensor PBP can bind to the target polynucleotide, if present;
 - applying a light source that can excite the multichromophore; and
 - detecting whether light is emitted from the signaling chromophore, thereby indicating binding of the sensor polynucleotide binding protein to the target polynucleotide.
2. (Previously Presented) The method of claim 1, wherein the multichromophore comprises a structure selected from a saturated polymer, a conjugated polymer, a dendrimer, and a semiconductor nanocrystal.
3. (Withdrawn) The method of claim 2, wherein the multichromophore comprises a

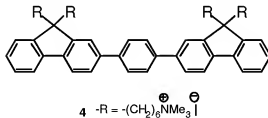
saturated polymer.

4. (Withdrawn) The method of claim 2, wherein the multichromophore comprises a dendrimer.
5. (Withdrawn) The method of claim 2, wherein the multichromophore comprises a semiconductor nanocrystal.
6. (Previously Presented) The method of claim 2, wherein the multichromophore comprises a conjugated polymer.
7. (Withdrawn) The method of claim 6, wherein the conjugated polymer has the structure

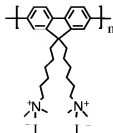


where $n=2-100,000$.

8. (Withdrawn) The method of claim 6, wherein the conjugated polymer has the structure

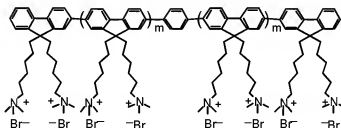


9. (Previously Presented) The method of claim 6, wherein the conjugated polymer has the structure



where $n=2-100,000$.

10. (Withdrawn) The method of claim 6, wherein the conjugated polymer has the structure



where $m = 1$ or 2 .

11. (Cancelled)

12. (Previously Presented) The method of claim 1, wherein the sample is contacted with the sensor PBP and the multichromophore in the presence of a sufficient amount of an organic solvent to decrease hydrophobic interactions between the sensor PBP and the multichromophore.

13. (Previously Presented) The method of claim 1, wherein the sample is contacted with a plurality of different sensor PBPs, said different sensor PBPs comprising a corresponding different signaling chromophore, wherein each of said different sensor PBPs can selectively bind to a corresponding different target polynucleotide.

14. (Previously Presented) The method of claim 1, wherein the chromophore is a fluorophore.
15. (Previously Presented) The method of claim 14, wherein the fluorophore is selected from a semiconductor nanocrystal, a fluorescent dye, a lanthanide chelate, and a green fluorescent protein.
16. (Withdrawn) The method of claim 15, wherein the fluorophore is a semiconductor nanocrystal.
17. (Previously Presented) The method of claim 15, wherein the fluorophore is a fluorescent dye.
18. (Previously Presented) The method of claim 17, wherein the fluorescent dye is fluorescein.
19. (Withdrawn) The method of claim 15, wherein the fluorophore is a lanthanide chelate.
20. (Withdrawn) The method of claim 1, wherein the target polynucleotide is DNA.
21. (Previously Presented) The method of claim 1, wherein the target polynucleotide is RNA.
22. (Previously Presented) The method of claim 1, wherein the sample comprises single-stranded target polynucleotide.
23. (Withdrawn) The method of claim 1, wherein the sample comprises double-stranded target polynucleotide.

24. (Withdrawn) The method of claim 1, wherein the target polynucleotide is produced via an amplification reaction.
- 25-26. (Cancelled)
27. (Previously Presented) The method of claim 1, wherein light emitted from the signaling chromophore above a threshold level indicates that the target polynucleotide is present in the sample.
28. (Previously Presented) The method of claim 1, wherein the amount of light emitted from the signaling chromophore is quantitated and used to determine the amount of the target polynucleotide in the sample.
29. (Withdrawn) The method of claim 15, wherein the fluorophore is a green fluorescent protein.
30. (Previously Presented) The method of claim 1, wherein the target polynucleotide is not amplified.
31. (Previously Presented) The method of claim 1, wherein the method is performed on a substrate.
32. (Previously Presented) The method of claim 1, wherein the amount of light emitted from the signaling chromophore upon excitation of the multichromophore is greater than the amount of light obtained upon direct excitation of the signaling chromophore.
33. (Currently Amended) An energy transfer assay method for analyzing binding of a sensor polynucleotide binding protein to a target polynucleotide ~~An assay method comprising:~~
providing a sample that is suspected of containing a target polynucleotide;

providing a polycationic multichromophore that interacts with the target polynucleotide and upon excitation is capable of transferring energy to a signaling chromophore;

providing a sensor polynucleotide binding protein (PBP) that can bind to the target polynucleotide, said sensor PBP conjugated to the signaling chromophore;

contacting the sample with the sensor PBP and the multichromophore in a solution under conditions in which the sensor PBP can preferentially bind to the target polynucleotide, if present;

applying a light source that can excite the multichromophore; and

detecting whether light is emitted from the signaling chromophore, thereby indicating binding of the sensor polynucleotide binding protein to the target polynucleotide.